R E M A R K S

Entry of this Amendment under 37 C.F.R. §1.116 is respectfully requested, because it cancels claims, thereby placing the application in better condition for consideration on appeal. No new matter is believed to be added to this application by this Amendment.

Status of the Claims

Upon entry of this Amendment, claims 1, 3, 5, 7, 9, 11, 13, 15, 17, 19-32 and 37-54 are pending in the application. Claims 4, 6, 8, 10, 12, 14, 16, 18, 33, 35 and 36 are canceled by this Amendment. Claims 19-32 and 37-40 have been withdrawn from consideration by the Examiner. Support for the amendments to claim 1 and for newly added claims 47-51 can be found at page 15 of the specification. Newly added claims 52-54 correspond to canceled claims 33, 35 and 36, and find additional support at page 15 of the specification.

Claim Objections (Paragraph 3 of the Office Action)

Claims 4, 6, 8, 10, 12, 14, 16 and 18 are objected to as containing informalities. Claims 4, 6, 8, 10, 12, 14, 16 and 18 are canceled by this Amendment, thereby obviating the Examiner's objection.

Rejection Under 35 U.S.C. §102(b) Over Yamamoto '406 (Paragraphs 4-8 of the Office Action)

Claims 1, 15, 17, 33, 35, 36 and 41-46 are rejected under 35 U.S.C. §102(b) as being anticipated by Yamamoto '406 (US Patent 5,406,406). Applicants traverse this rejection, and respectfully request reconsideration and withdrawal thereof.

The Present Invention and Its Advantages

The present invention, as is set forth in instantly amended claim 1, pertains to an organic waveguide that has a substrate, a buffer layer over the substrate, an organic polymer core section over the buffer layer, and a clad section covering an upper surface of the core section and made from an inorganic dielectric. The inorganic dielectric has a lower refractive index than that of the core section. See Figure 1 of the application.

The geometric configuration of the organic waveguide formed over the substrate makes this waveguide amenable to manufacturing using semiconductor manufacturing techniques. That is, the clad section that covers the upper surface of the core section can be formed by such techniques as sputtering, CVD or vapor deposition. As a result, the clad section can be easily made into the same shape as the core section without forming a thick overclad on the sides of the organic waveguide. This results in the easy

integration with other optical elements on the same substrate. Therefore, a simpler manufacturing process is obtained.

Distinctions of the Present Invention Over Yamamoto '406

Yamamoto '406 pertains to wavelength conversion devices formed from a molecular crystal such as N-isopropyl-N'-(4-acetylphenyl)-urea. Figure 7 of Yamamoto '406 shows a core 1 sandwiched between two cladding layers 2. This sandwich construction is held together by strips of adhesive polymer 3. The construction set forth in Yamamoto '406 is suitable for fiber-optic applications. Yamamoto '406 at column 5, lines 23-24 describes "a fiber waveguide-type optical wavelength conversion device."

Yamamoto '406 fails to disclose or suggest an organic waveguide formed from a core section over a substrate that can be silicon. Yamamoto '406 additionally fails to disclose or suggest a buffer layer between the substrate and the core section.

As a result, the fiber waveguide-type optical wavelength conversion device of Yamamoto '406 has a structure fundamentally different from that of the present invention, and fails to disclose many of the instantly claimed embodiments. Accordingly, Yamamoto '406 fails to anticipate the instantly claimed invention. Further, the fundamentally different structure of Yamamoto '406 would not motivate a person having an ordinary skill in the art to

utilize its teachings as the basis of the *prima facie* case of obviousness.

Consequently, the rejection under 35 U.S.C. §102(b) is overcome, and withdrawal thereof is proper.

Rejection Under 35 U.S.C. §103(a) Over Yamamoto '406 in View of Eda '540

Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Yamamoto '406 in view of Eda '540 (US Patent 5,485,540). Applicants traverse this rejection, and respectfully request reconsideration and withdrawal thereof.

The Examiner turns to Eda '540 for teachings pertaining to a silicon oxide clad layer. However, Eda '540 fails to address the deficiencies of Yamamoto '406 in suggesting an embodiment of the present invention.

Eda '540 pertains to an optical wavelength device bonded through direct bonding. Eda '540 at column 14, lines 60-61, states the "clad layer 52 is practically made of silicon oxide or silicon nitride." In Eda '540, the optical waveguide portion 3 is part of the glass substrate 2. Eda '540 fails to disclose a core section made of organic polymer.

Both the optical waveguide of Eda '540 and the fiber optic sandwich of Yamamoto '406 have structures and compositions fundamentally different than the organic waveguide of the present

invention. As a result, a person having ordinary skill in the art has no motivation to combine the teachings of Eda '540 with Yamamoto '406 to produce an embodiment of the present invention. As a result, the *prima facie* case of obviousness has not been made. Accordingly, this rejection is overcome, and withdrawal thereof is proper.

Rejection Under 35 U.S.C. §103(a) Over Yamamoto '406 in View of Lösch '568 (Paragraphs 15-18 of the Office Action)

Claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over Yamamoto '406 in view of Lösch '568 (US Patent 5,940,568). Applicants traverse this rejection, and respectfully request reconsideration and withdrawal thereof.

Lösch '568 pertains to a planar optical waveguide wherein the cladding layer is patterned in such a way that ultraviolet laser light directed to the waveguide forms an optical interference pattern in the core. See Abstract of Lösch '568. The waveguide of Lösch '568 is an interferometric waveguide having a structure fundamentally different from the organic waveguide of the present invention.

In the Office Action, the Examiner turns to the teachings of Lösch '568 for the utilization of a cladding layer as a mask. However, the Examiner fails to demonstrate how the teachings of Lösch '568 address the failures of Yamamoto '406 in suggesting an

embodiment of the present invention. As a result, a person having ordinary skill in the art would not be motivated to combine the teachings of Lösch '568 with those of Yamamoto '406 to produce an embodiment of the present invention. As a result, the *prima facie* case of obviousness has not been made. Accordingly, this rejection is overcome and withdrawal thereof is proper.

Rejection Under 35 U.S.C. §103(a) Over Yamamoto '406 in View of Ishiharada '088 (Paragraphs 19-22 of the Office Action)

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over Yamamoto '406 in view of Ishiharada '088 (US Patent 5,692,088). Applicants traverse this rejection, and respectfully request reconsideration and withdrawal thereof.

Ishiharada '088 pertains to an optical waveguide tube in which hollow tubular cladding 2 is filled with a liquid or fluid transparent core 3 and locked at opposite open ends with plugs 4a, 4b. See Ishiharada '088 at column 10, lines 17-19. This structure of Ishiharada '088 is fundamentally different from the organic waveguide formed over a substrate of the present invention.

The teachings of Ishiharada '088 are turned to for teachings pertaining to an optical waveguide having a core layer surrounding the cladding for the purpose of shielding light. However, the fundamental differences between Ishiharada '088 and Yamamoto '406

would fail to motivate a person having ordinary skill in the art to combine these references to produce a claimed embodiment of the present invention. Accordingly, the *prima facie* case of obviousness has not been made, and withdrawal of this rejection under 35 U.S.C. §103(a) is proper.

Rejection Under 35 U.S.C. §103(a) Over Yamamoto '406 in View of Eda '540 and Further in View of Maruo '619 (Paragraphs 23-26 of the Office Action)

Claims 9, 11 and 13 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamamoto '406 in view of Eda '540 and further in view of Maruo '619 (US Patent 5,572,619). Applicants traverse this rejection, and respectfully request reconsideration and withdrawal thereof.

Maruo '619 pertains to a polyimide optical waveguide constructed in a sandwich configuration similar to Yamamoto '406. See Figure 2 of Maruo '619. However, Maruo '619 fails to address the deficiencies of Yamamoto '406 and Eda '540 in suggesting an embodiment of the present invention. As a result, the combination of Maruo '619, Eda '540 and Yamamoto '406 are insufficient to assert *prima facie* obviousness over the instantly claimed invention. Accordingly, this rejection is overcome, and withdrawal thereof is proper.

Conclusion

Accordingly, in view of the above amendments and remarks, reconsideration and withdrawal of the rejections, and allowance of the claims of the present application, are respectfully requested. In the event that the present Reply does not place the present application into condition for allowance, entry thereof is respectfully requested as placing the present application in better condition for Appeal.

If the Examiner has any questions concerning this application, he is requested to contact Robert E. Goozner, Ph.D., Reg. No. 42,593, at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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By _____

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MSW/REG:gml
Attachment: Version with Markings to Show Changes Made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 4, 6, 8, 10, 12, 14, 16, 18, 33, 35 and 36 have been canceled.

The claims have been amended as follows:

1. (Twice Amended) An organic waveguide comprising:

a substrate;

a buffer layer over the substrate;

a core section over the buffer layer, the core section being made of organic polymer; and

a clad section covering an upper surface of the core section and made of inorganic dielectric having a lower refractive index than that of the core section, the clad section being formed by sputtering, CVD or vapor deposition.

Claims 47-54 have been added.